

XXIII. *On the natural affinities of the Lepidoptera hitherto referred to the genus Acronycta of authors.* By ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

[Read November 5th, 1879.]

(Plate XI.)

It is a generally-recognized fact amongst Lepidopterists that whilst the structure of the perfect insects decides to what genera they are referable, the larval characters are of greater importance as deciding in what family they ought to be placed; thus Mr. Bates, in his classification of the Butterflies, founded his families entirely upon characters supplied by the early stages.

A short time since Mr. F. Moore called my attention to the fact that the genus *Diptera* (Ochs.) contained two series of species allied by structure, coloration, pattern and larval characters to genera already existing in the two widely-differing families *Arctiidae* and *Notodontidae*; the European *D. ludifica* representing the *Notodontid* type and being nearly allied to *Harpyia*, *Dicranura* and other genera of "Puss-moths," and *D. orion* representing the *Arctiid* type near to *Epantheria* and *Ardyces*.

Upon mentioning the above rather startling facts to Lord Walsingham he very kindly offered to bring his preserved larvæ of *D. orion* to the Museum for me to see, and as they stand in the same drawer with the greater part of his beautiful series of larvæ of *Acronycta*, I was enabled, with his lordship's permission, whilst verifying the conclusions arrived at by Mr. Moore, to examine into the natural affinities of *Acronycta*.

The family *Bombycoidea*, so far as I can ascertain, was instituted by Dr. Boisduval and adopted by M. Guénée for the reception of a series of Noctuidiform moths having Bombyciform larvæ; but the genus *Acronycta* as characterized by M. Guénée contains larvæ appertaining

in character to both tribes: on looking over Lord Walsingham's series I was not a little startled to find larvæ agreeing in all respects with those of the families *Arctiidae*, *Liparidae* and *Notodontidae* in addition to two of a Noctuid type; for although the larvæ of *Acronycta psi* and *tridens* had long been familiar to me by breeding, and I had several times met with one or two of the others which I had failed to breed, the fact of their perfectly Bombyciform character had never before been prominently brought to my notice.

Seeing, then, the heterogeneous material constituting the genus *Acronycta*, the first thing which I felt bound to do was to look into the structural characters of the moths themselves. After examining the neuration of all the species in the National Collection I was at first staggered to find that the differences between them in this respect were barely sufficient to separate them generically from one another, and I was almost inclined to think that Dr. Boisduval had been justified in instituting the family *Bombycoideæ* for their reception; seeing, however, that differences of greater importance existed in the palpi, I was led to examine the wing-veining of all the families to which the various larvæ of *Acronycta* naturally allied them; the result was most satisfactory, as it clearly demonstrated that this type of neuration was a common one, repeating itself with slight modifications in all these groups of Moths.

The neuration of *Acronycta* (auct.) is as follows:—

*Primaries*, costal vein terminating at about the third fourth of costa; subcostal five-branched, the first two branches being emitted before the end of the discoidal cell, the second united by means of a short oblique cross-vein to the third which is trifurcate; upper radial emitted from the anterior extremity of the cell and close to the origin of the third subcostal branch; lower radial emitted close to the third median branch so as almost to form a fourth median nervule; upper discocellular consequently very long, concave; lower discocellular very short (or even absent). *Secondaries*, with the costal and subcostal veins united at their origins, the subcostal bifurcate, sometimes emitting its branches at the end of the cell, sometimes (*Acrionicta* (sic) Ochs.) beyond it, from a short footstalk; radial emitted from near the centre of the discocellulars, but in some species more nearly approximated to the median branches than in others; upper discocellular angu-

lated, always longer than the lower, the latter oblique; remaining veins normal.

From this type of neuration the genus *Ecpantheria* (*Arctiidae*)\* differs in the emission of the second subcostal branch of the primaries at some distance beyond the end of the cell, and, as a natural consequence, in the absence of the little cross-vein uniting it to the third branch; in the secondaries, moreover, the radial is emitted close to the third branch of the median vein. As these differences are not so great as those existing between many genera associated under the same family, and as *Diptera orion* and its allies is intermediate in structure, I see no reason why Hübner's genus *Phaetra* should not be reinstated for the reception of *A. rumicis*, *auricoma* and allies, and placed in the *Arctiidae*.

In the *Liparidae*, the genus *Leucoma*, though so broad in the wing that nobody would naturally suspect it of affinity to *Acronycta*, differs in its neuration in only two important points, that is to say, in the position of the cross-veinlet uniting the second and third subcostal branches of the primaries and in the slight displacement of the second median branch, which is emitted farther from the end of the cell; the difference in the structure of the antennæ not being of more than generic importance, I would propose the removal of *A. leporina*, the type of *Acronicta* (sic) Ochs., to the *Liparidae*.

*A. aceris* differs from *A. leporina* not only in the greater size of its secondaries and thicker shorter palpi (the palpi of *A. leporina* being markedly slender and long as compared with the other species), but its larva is extremely like that of *Dasychira*: a comparison of the wing-structure of *A. aceris* with that of *Dasychira* shows only one difference, that is, in the slight displacement of the radial of secondaries, which is emitted much nearer to the origin of the third median branch. I would, therefore, place *A. aceris*, as type of Hübner's genus *Artomyseis*, near to *Dasychira*.

*A. megagephala*, both in its larval character and coloration, much resembles some of the genera allied to *Pygæra*; if we compare it with *Pygæra* and *Symmerista* we find that it differs from the former in the displacement of the lower radial of primaries, and from the latter in the displacement

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\* Possessing the same thickened but simple antennæ as in *Acronycta*.

of the second subcostal branch, the cross-vein being absent: this species, therefore, should be referred to the *Notodontidæ* as type of a genus near *Symmerista*.

*A. psi* and *tridens*, which have *Notodontid* larvæ, are referable to the genus *Triæna*, Hübner, and the nearly-allied form *A. strigosa* to the genus *Hyboma* of the same author: they may be placed next to *Gluphisia*, which differs in neuration in the slightly-irregular form of the second subcostal branch of primaries (which is, however, similarly situated and united in the same way to the third branch); it differs, also, in the second and third median branches of secondaries being placed upon a short foot-stalk.

*A. alni* appears to be referable to the *Noctuities*, the caterpillar much resembling both in colour and in its clavate hairs the larva of *Tinolius*, the latter, however, is a semi-looper, and, therefore, not nearly related to it: this species is the type of Hübner's genus *Jocheæra*.

*A. ligustri* seems to be a *Noctuid*, the larva being smooth, green, with yellow longitudinal lines, and a few scattered long hairs;\* the neuration agrees with *Mamestra*, and I should place it provisionally with that genus.

The *Acronyctæ*, then, will be distributed as follows:—

#### ARCTIIDÆ.

*Pharetra*, Hübner.

*P. rumicis*, *P. auricoma* and allies.

#### LIPARIDÆ.

*Acrionicta*, Ochs.

*A. leporina*, *A. simplex*.

*Artomyscis*, Hübner.

*A. aceris*, *A. hastulifera*, &c.

#### NOTODONTIDÆ.

Genus —?

*A. megacephala* and allies.

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\* Hübner's figure makes these hairs more prominent than they really are.

*Triæna*, Hübner.

*T. psi*, *T. tridens* and allies.

*Hyboma*, Hübner.

*H. strigosa*.

Tribe NOCTUITES.

*Jocheæra*, Hübner.

*J. alni*.

*Mamestra*, Ochs.

*M. ligustri*.

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DESCRIPTION OF PLATE XI.

- Fig. 1. *Acronicta leporina*, *Linn.*, neuration.  
" 1a. " " " palpus.  
" 2. *Triæna psi*, *Linn.*, neuration.  
" 2a. " " " palpus.  
" 3. *Epantheria læta* ♀, *Walk.*, neuration.  
" 4. *Leucoma vau-nigrum* ♀, *Fabr.*, neuration.  
" 5. *Dasychira pudibunda* ♀, *Linn.*, neuration.  
" 6. *Pygæra bucephala*, *Linn.*, neuration.  
" 7. *Symmerista amazonica* ♀, *Butl.*, neuration.  
" 8. *Gluphisia crenata* ♀, *Esper*, neuration.  
" 9. *Tinolius eburneigutta*, *Walk.*, larva.